# CLAIMS

1) A multipurpose packing machine comprising an input portion (2) and an output portion (3), and wherein the input portion (2) comprises at least a first packing module (26) for forming a succession of first packages (31) about respective packed groups (13) of cigarettes, to produce a succession of first packets (30); characterized in that the output portion (3) comprises at least a second packing module (33; 46; 53; 62; 70) similar to the first packing module (26) and for forming a succession of second packets (35; 49; 57), each having a second package (37; 50; 58) housing at least one respective first packet (30).

2) A machine as claimed in Claim 1, wherein said first and said second packing module (26, 33; 26, 46; 26, 53; 26, 62; 26, 70) each comprise a respective input wheel (19; 38) and a respective output wheel (23; 39) having a first and a second axis (20, 27; 40, 41) respectively; the input wheel (19, 38) and the output wheel (23, 39) rotating in steps about the relative said first and second axis (20, 27; 40, 41).

3) A machine as claimed in Claim 2, wherein, in each said first and second packing module (26, 33; 26, 46; 26, 53; 26, 62; 26, 70), said first and second axis (20, 27; 40, 41) are crosswise to each other.

4) A machine as claimed in Claim 2 or 3, wherein, in each said first and second packing module (26, 33; 26, 46; 26, 53; 26, 62; 26, 70), the first axis (20; 40) is a vertical axis, and the second axis (27; 41) is a horizontal axis.

5) A machine as claimed in any one of Claims 2 to 4, and comprising a number of feed lines (25, 29, 43; 25, 29, 52; 25, 29, 61; 25, 29, 65; 25, 29, 72) for relative blanks (22, 28 34; 22, 28, 48; 22, 28, 56; 22, 28, 63; 22, 28, 71); the first packing module (26) comprising a first transfer station (24) connecting the relative input wheel (19) to the relative output wheel (23), and a first said feed line (25) for feeding a succession of first said blanks (22) at least partly defining relative said first

packages (31); the first feed line (25) being connected to the input wheel (19) of the first packing module (26) at a first input station (21) located upstream from the first transfer station (24).

6) A machine as claimed in Claim 5, wherein the first packing module (26) comprises a second said feed line (29) for feeding a succession of second said blanks (28), each at least partly defining a relative said first package (31); the second feed line (29) feeding the second blanks (28) between the input wheel (19) and the output wheel (23) of the first packing module (26), at the first transfer station (24).

7) A machine as claimed in Claim 5 or 6, wherein the second packing module (33; 46; 53; 62; 70) comprises a second transfer station (42; 42a, 51; 64) connecting the relative input wheel (38) to the relative output wheel (39), and for transferring said first packets (30) from the input wheel (38) to the output wheel (39); and a third said feed line (43; 52; 61; 65; 72) for feeding a succession of third said blanks (34; 48; 56; 63; 71), each at least partly defining a relative said second package (37; 50; 58); the third feed line (43; 52; 61; 65; 72) feeding the third blanks (34; 48; 56; 63; 71) between the input wheel (38) and the output wheel (39) of the second packing module (33; 46; 53; 62; 70), at the second transfer station (42; 42a; 51; 64).

8) A machine as claimed in Claim 7, wherein said second transfer station (42; 42a; 64) is a station for successively transferring said first packets (30) and the relative third blanks (34; 56; 63; 71) to the output wheel (23; 39) of the second packing module (33; 53; 62; 70) to form a succession of said second packets (35; 57), each having a respective second package (37; 58) housing a respective first packet (30).

9) A machine as claimed in Claim 7, wherein said second transfer station (51) is a station for accumulating said first packets (30) into first groups (47), and for transferring said first groups (47) and the relative third blanks (48) to the output wheel (39) of the second packing module (46) to form a succession of said second packets (49), each having a respective second package (50) housing a respective first

group (47).

10) A machine as claimed in Claim 7, wherein the second packing module (62) comprises, between the first transfer station (32) and the second transfer station (64), an accumulating station (51a; 51b) for combining with a first packet (30), advanced by the input wheel (38), at least one further first packet (30) previously unloaded off the input wheel (38) at said accumulating station (51a; 51b), and for forming a relative first group (47; 47a) of first packets (30).

11) A machine as claimed in Claim 7, wherein said second packing module (53) comprises a further feed line (60) connected to the input wheel (38) at a second input station (59) located upstream from the second transfer station (42); the further feed line (60) supplying the input wheel (38) with a succession of objects (54), and combining each object (54), at the second input station (59), with a relative first packet (30) to form a relative second group (55); and said second transfer station (42) being a station for successively transferring said second groups (55) and the relative third blanks (56) to the output wheel (39) of the second packing module (53) to form a succession of said second packets (57), each having a respective second package (58) housing a respective second group (55).

12) A machine as claimed in Claim 11, wherein each said object (54) is a packet similar or identical to the relative first packet (30).

13) A machine as claimed in any one of Claims 2 to 12, wherein the output wheel of the second packing module is a reversible wheel.

14) A machine as claimed in any one of Claims 5 to 13, wherein said second packing module (33; 46; 53; 62; 70) comprises an auxiliary output wheel (45) located downstream from the relative output wheel (39); the auxiliary output wheel (45) being a wheel for turning the second packets (35; 49; 57) over through 180°.

15) A machine as claimed in Claim 14, wherein the second packing module (33; 46; 53; 62; 70) comprises a fourth feed line (66) for a succession of fourth blanks (67); the fourth feed line (66) feeding the fourth blanks (67) between the

output wheel (39) and the auxiliary output wheel (45) of the second packing module (33; 46; 53; 62; 70) to pack the second packets (35; 49; 57).

16) A machine as claimed in any one of Claims 7 to 15, and comprising at least two said second packing modules (33; 46; 53; 62; 70) in series; each said second packing module (33; 46; 53; 62; 70) comprising a respective third feed line (43; 52; 61; 65; 72) for a respective succession of said third blanks (34; 48; 56; 63; 71).

17) A machine as claimed in any one of Claims 7 to 16, wherein the second feed line (29) feeds the second blanks (28) to the first transfer station (24) in a first direction (68), and the third feed line (43; 52; 61; 65) feeds the relative third blanks (34; 48; 56; 63) to the relative second transfer station (42; 42a; 51; 64) in a second direction (69); said first and said second direction (68, 69) being crosswise to each other.

18) A machine as claimed in Claim 17, wherein said first direction (68) is parallel to the second axes (27; 41), and said second direction (69) is crosswise to the second axes (27; 41).

19) A machine as claimed in any one of Claims 5 to 18, wherein the input wheel (38) of the second packing module (33; 46; 53; 62) has an outer periphery designed to support the relative packed groups (13) positioned flat and with their respective longitudinal axes substantially tangent to the outer periphery and crosswise to the relative first axis (40).

20) A machine as claimed in Claim 19, wherein the output wheel (39) of the second packing module (33; 46; 53) has an outer periphery designed to support the relative packed groups (13) positioned on edge and with their respective longitudinal axes parallel to the relative second axis (41).

21) A machine as claimed in Claim 20, wherein the output wheel (39) of the second packing module (62; 70) has an outer periphery designed to support the relative packed groups (13) positioned flat and with their respective longitudinal axes

parallel to the relative second axis (41).

22) A machine as claimed in any one of Claims 7 to 16, wherein the second feed line (29) feeds the second blanks (28) to the first transfer station (24) in a first direction (68), and the third feed line (72) feeds the relative third blanks (71) to the relative second transfer station (42a) in a second direction (73); said first and said second direction (68, 73) being parallel to each other and to the second axes (27, 41).

23) A machine as claimed in Claim 22, wherein, in each packing module (26, 70), the input wheel (19; 38a) has an outer periphery designed to support the relative packed groups (13) positioned on edge and with their respective longitudinal axes substantially tangent to the outer periphery of the input wheel (19; 38a) and crosswise to the relative first axis (20; 40a); and the output wheel (23; 39) has an outer periphery designed to support the relative packed groups (13) positioned flat and with their respective longitudinal axes parallel to the relative second axis (27; 41a).